

Awareness and perception of medical students of al-baha University regarding eye health

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ABSTRACT

Introduction: The study aimed to assess the awareness and perception of Al Baha medical students towards; High altitude, Medications, Contact lenses, pregnancy, and Ultraviolet effects on eye health. **Methods:** The study was cross-sectional student-based involving both male and female medical students who fit the inclusion criteria. The online six-domain questionnaire was used in gathering the required data. Then the validity and reliability were checked, descriptive statistics and logistic regression were used to determine the association between the required exposures and the outcomes in a form of Odd's ratios the significance level was tested at $p\text{-value} \leq 0.05$. **Results:** A-173 students through 7-medical academic years were enrolled in the study. More than half (55%) were males at the 6th-year academic level (30.6%) and two-third (39.3%) scored a very good Grade Point Average (GPA). Low level of awareness was observed among the males students at early and late academic levels regardless of their GPA scores towards High altitude (OR= -0.463, CI= -1.577- 0.562) and pregnancy (OR= -0.152, CI= -0.488- 0.184) effects on eye health, whilst high awareness level was attained towards the medications (OR= -0.301, CI= -1.287- 0.685) contact lens (OR= -16.029, CI= -39.095- 7.038) and Ultraviolet (OR= -51.895, CI= -147.689- 43.899) effects among female over male students. **Conclusion:** To conclude, the participants showed different awareness levels out of our expectations with respect to the effect of high altitude and pregnancy and high levels regarding medications, contact lens, and Ultraviolet effect on eye health.

Keywords: Medical Students, Eye Health, Awareness, High altitude, Medications, Contact lens, Pregnancy and Ultraviolet



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1. INTRODUCTION

Eyes are the only window through which the body intern can be seen, this award ophthalmologists the chance to discover a wide ranges of systemic disorders earlier even before appearance of their clinical presentations (Henry, 1990). Eye doctors were acquainted with the clinical disorders because they could be the presenting complain of fatal systemic disorders such as; inflammation of the eye may be the presenting complain of the potentially lethal disease (Perez et al., 2004). Wide range of systemic diseases; Cardiovascular, inflammatory, autoimmune, metabolic, endocrine, and neurological diseases, have clear manifestations in human eyes (Wu et al., 2004; Rathinam et al., 2010; Paovic et al., 2013). Early discovery and treatment of these systemic disorders lowering patient's mortality and morbidity rate (Klig, 2008). Ocular manifestations in pediatric is of special importance because it may be associated with other congenital anomalies in addition to the limited period of visual maturity resulting in lazy eye if defects do not treated in early life (Allen et al., 2010). It is interesting to know even animals' eyes shows the same benefit, giving veterinarian the opportunity to discover and follow their patient animals (Wotman, 2017; La Croix, 2005; Annoura et al., 2020).

Medical students

Globally Medical student use to lead outreach programs under supervision toperform regular eye care to their communities while providing referrals to a relevant clinic for those with sophisticated diseases (Williams, 2019). Initiative national health Education programs for medical nurse student in United States, is reformed to implement community health care to direct student toward community health work experience of the professional Community practice (Steffy, 2019). Based on the mission of their faculty, the medical student of Al Baha university have special care of national and international awareness and screening events and campaigns eg; day of vision, Diabetes day, Breast cancer etc, in form of shows and events in public places with direct contact to Al Baha population (<https://bu.edu.sa/en/web/faculty-of-medicine/future-doctors-club>. cited on 25.11.2021at 6:45 pm).

High altitude effect on the eye

Al Baha area is especial example for high altitude areas in KSA, and now a day's high altitude in medicine has its a separate specialty and concern because its direct effect on human body (Kiwanuka, 2015; Johnson et al., 2016; Kappen et al., 2018). High altitude has special care in ophthalmology due to its effect on our eyes, so it is of great importance to assess the knowledge of medical students especially in high areas like Al Baha (Willmann et al., 2017; Baertschi et al., 2016). Study for Mongolian population demonstrates a high prevalence rate of dry eye disease and Dry eye signs were significantly associated with dry eye symptoms (Jha & Kirti, 2021).

Drugs effects on the eye

Wide range of systemic medications has ocular adverse effects. Dryness may be caused by antihistamines, beta- blockers. Visual acuity may be affected by sulfonamides, the antifungal agent metronidazole, thiazide diuretics, and carbonic anhydrase inhibitors (Jaanus, 1992). Mydriasis may be caused by ant cholinergic, antihistamines, antidepressant agents, and central nervous system stimulants such as cocaine, methylphenidate, and amphetamines (Maayani, 1975). Abnormal eye movements like nystagmus, diplopia, and extraocular muscle palsies have been associated with central nervous system depressants. Eye pressure can be raised by corticosteroids (Taylor, 2008). Retinal toxicity can be caused by chloroquine and hydroxychloroquine. Antituberculosis medications ethambutol and isoniazid abridged acuity, visual field faults, and color vision defect. Optic and retrobulbar neuritis may result from the use of Chloramphenicol (Li Junping, 2008).

Contact lens effect on the eye

Contact lenses are concerned as medical devices putted directly on the cornea surface. It can substitute uses of eyeglasses. It is safe and effective method for refractive errors correction if used in right manner. They are alternative to eyeglasses wearing, beside their Cosmetic uses. Contact lens wearing in ophthalmology is of great concern because beside its innovative uses it has disastrous complications when use without awareness or caution (Tichenor et al., 2021). In study conducted in Ghanan 2021; revealed that; complications were more common in soft contact lens wearers and giant papillary conjunctivitis was the most common complication, and following contact lens wearing care advices and good personal hygiene prevent the majority of complications (Kobia-Acquah, 2121).

Eye care during Pregnancy

Special eye care is needed for pregnant lady because Pregnancy is associated with many ocular changes, this need close collaboration between obstetrician and ophthalmologist, both doctors should be aware enough to keep eyes of pregnant women save (Taradaj, 2018; Ibraheem et al., 2016; Yenerel & Kucumen, 2015).

Ultraviolet effects on the Eye

The scientific studies confirmed that photokeratitis and photo-conjunctivitis caused by exposure to acute high dose of UV radiation, while even low dose for long experience to UV emission is a hazardous for pterygium, cataract, and squamous cell carcinoma (Yam & Kwok, 2014). Simple health care attitude, proper clothing, hats, and UV filter goggles, sunglasses or contact lens are effective procedures for UV fortification (Lucas, 2011). Short-term effects of altitude on the eyes are frequently noticed on the low lander ascending to high altitude. The long-term effects of altitude are seen in the native of high altitude. High altitude represents a natural stress due to low baro-metric pressure and lower oxygen partial pressure (PO₂). Although, medical students are the doctors of the future with effective positive role in their communities, it is of great importance to assess their awareness and perception for eye health. Al Baha is considered as a high altitude area which require a special eye care, This study was set out to assess the awareness and perception of Al Baha medical students towards; High altitude, Medications, Contact lens, pregnancy and Ultraviolet effects on the eye health.

2. METHODOLOGY**Ethical considerations**

The study was approved by Research Ethical Committee of Faculty of Medicine, Al Bah University, under approval number (REC/SUR/BU-FM/2021/0109), also personal informed consent was taken from each participant before enrolled in the study.

Study design and sampling

The study design was a cross-sectional student-based involving both male and female medical student sections. It is a two-month life span study conducted during the April and May, 2021. The Study excluded any medical students who disagree to join our study or not fit our inclusion criteria. The convenience sample size was determined by general coverage from all positively responded medical students at different levels

Data collection

The data were gathered through online questionnaire using Google's tools. Where a WhatsApp groups were created for different medical students academic levels (1-7), then a pre-designed form link was distributed among these groups. The required data include six domains; personal information, high altitude, medication, contact lens, pregnancy, ultraviolet exposure effects. The filled data form was retrieved in an Excel sheet format.

Data analysis

The data were analyzed using SPSS. Where data were coded and entered to the software. The questionnaire validity and reliability are checked using (α -Cronbach = 0.949 and Validity = 0.974), then descriptive statistics were used to describe various variables, logistic regression was used for the association determination between the required exposures and the outcomes as adjusted odd ratios with their 95% confidence interval and their level of significance at p-value level of ≤ 0.05 for different multivariate comparison using suitable inferential statistic test.

3. RESULTS

Population Characteristics, n= 173. The majority (55%) of the study contributors were men (Fig. 1) at 6th year academic level (30.6%) (Fig. 2) most of them (39.3%) have a very good Grade Point Average (GPA) (Fig. 3).

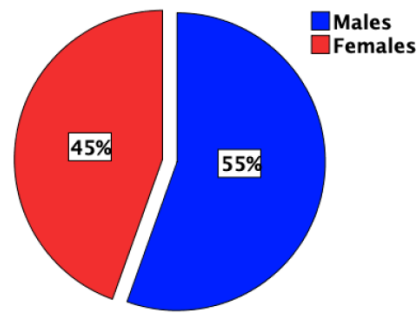


Figure 1 Distribution percentage of the students' (n=173) based-on their sex

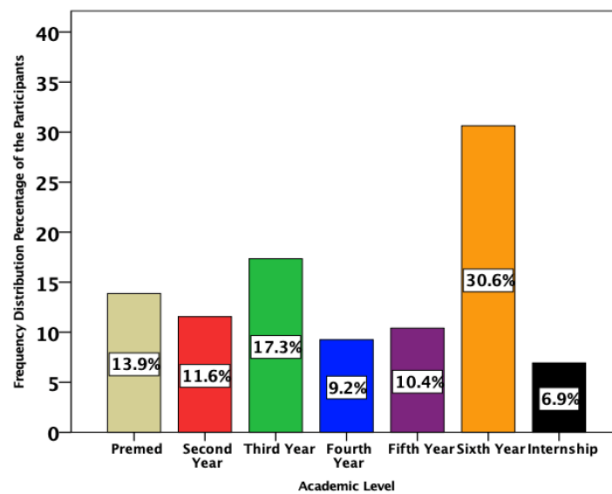


Figure 2 Distribution percentage of the students' (n=173) based-on their Academic levels

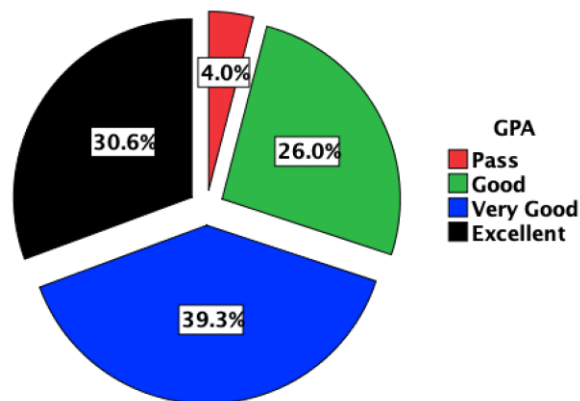


Figure 3 Distribution percentage of the students' (n=173) based-on their Grade Point Average (GPA).

The awareness of the Participants regarding the effect of high altitude on the eye health

The adjusted odd's ratios showed low level of awareness among the males students at the (1st, 2nd, 5th and 6th levels), this is contrary to the intermediate levels (3rd and 4th) whom showed high awareness levels regarding the relation between the high altitude effects as a risk factors for eye health (Table 1). The students with pass GPA believed that there is a strong relationship between the high altitude effects as risk factors for an eye health, unlike those with Good and Very good GPA whom attained a weak awareness (Table 1).

Table 1 The adjusted odds ratios (ORs) with associated 95% confidence interval (CI) with its lower and upper limits for the awareness of students with different characteristics regarding the high altitude effects on the eye health, n= 173

Parameter	Odd Ratio	Standard Error	p-value	95% Confidence Interval	
				Lower Limit	Upper Limit
Sex: Male	-0.463	0.569	0.416	-1.577	0.562
Academic Level					
1 st	-2.325	1.762	0.178	-5.778	1.127
2 nd	-2.917	2.108	0.166	-7.048	1.213
3 rd	0.810	1.309	0.536	-1.756	3.376
4 th	1.187	1.530	0.438	-1.812	4.186
5 th	-1.698	1.646	0.302	-4.925	1.529
6 th	-3.061	2.174	0.159	-7.322	1.200
GPA					
Pass	2.918	1.947	0.134	-0.899	6.735
Good	-0.446	0.679	0.511	-1.777	0.885
Very Good	0.623	0.568	0.272	-0.490	1.737

OR > 1; means a greater association, OR < 1; means a lower association and OR = 1; means there is no association between the exposure and outcome.

The awareness of the Participants regarding the effect of medications on the eye health

The adjusted odd's ratios showed low level of awareness among the males students at the (3rd and 4th levels), this is in contrast to (1st, 2nd, 5th and 6th levels) whom showed high awareness levels regarding the relation between the medication effects on eye health. The students with various GPA believed that there is a low relationship between the medication effects on eye health (Table 2).

Table 2 The adjusted odds ratios (ORs) with associated 95% confidence interval (CI) with its lower and upper limits for the awareness of students with different characteristics regarding the medication effects on the eye health, n= 173

Parameter	Odd Ratio	Standard Error	p-value	95% Confidence Interval	
				Lower Limit	Upper Limit
Sex: Male	-0.301	0.503	0.550	-1.287	0.685
Academic Level					
1 st	1.387	1.342	0.302	-1.244	4.018
2 nd	1.124	1.020	0.270	-0.874	3.123
3 rd	-0.654	0.784	0.404	-2.191	0.883
4 th	-1.955	1.520	0.198	-4.933	1.024
5 th	1.406	1.435	0.327	-1.406	4.218
6 th	1.626	1.311	0.215	-0.943	4.194
GPA					
Pass	-0.852	0.795	0.284	-2.409	0.705
Good	0.498	0.653	0.446	-0.783	1.779
Very Good	-0.245	0.472	0.603	-1.170	0.679

The awareness of the Participants regarding the Contact lens effect on the eye health

The adjusted odd's ratios showed low level of awareness among the males students at all academic levels regarding the relation between the contact lens effects on eye health. The students with very good GPA believed that there is a strong relationship between the contact lens effects on eye health, unlike others, (Table 3).

Table 3 The adjusted odds ratios (ORs) with associated 95% confidence interval (CI) with its lower and upper limits for the awareness of students with different characteristics regarding the contact lens effects on the eye health, n= 173

Parameter	Odd Ratio	Standard Error	p-value	95% Confidence Interval	
				Lower Limit	Upper Limit
Sex: Male	-16.029	11.769	0.173	-39.095	7.038
Academic Level					
1 st	-10.021	15.591	0.520	-40.579	20.537
2 nd	-9.073	15.221	0.551	-38.906	20.760
3 rd	-21.569	20.899	0.302	-62.531	19.393
4 th	-13.935	17.140	0.416	-47.528	19.658
5 th	-12.914	16.317	0.429	-44.894	19.067
6 th	-12.914	16.138	0.446	-43.914	19.344
GPA					
Pass	-4.273	16.038	0.790	-35.707	27.162
Good	-0.351	4.787	0.942	-9.734	9.033
Very Good	20.322	14.769	0.169	-8.624	49.269

The awareness of the Participants regarding the Pregnancy effect on the eye health

The adjusted odd's ratios showed low level of awareness among the males students at the (3rd and 4th levels), this is in contrast to (1st, 2nd, 5th and 6th levels) whom showed high awareness levels regarding the relation between the medication effects on eye health. The students with various GPA believed that there is a low relationship between the medication effects on eye health, (Table 4).

Table 4 The adjusted odds ratios (ORs) with associated 95% confidence interval (CI) with its lower and upper limits for the awareness of students with different characteristics regarding the pregnancy effects on the eye health, n= 173

Parameter	Odd Ratio	Standard Error	p-value	95% Confidence Interval	
				Lower Limit	Upper Limit
Sex: Male	-0.152	0.171	0.375	-0.488	0.184
Academic Level					
1 st	-1.120	0.937	0.232	-2.956	0.717
2 nd	-1.207	0.992	0.224	-3.151	0.737
3 rd	-1.519	1.232	0.218	-3.935	0.896
4 th	-1.180	0.962	0.220	-3.065	0.705
5 th	-0.843	0.705	0.232	-2.225	0.539
6 th	-0.999	0.832	0.230	-2.630	0.632
GPA					
Pass	-0.925	0.821	0.260	-2.534	0.684
Good	0.372	0.321	0.246	-0.257	1.000
Very Good	-0.015	0.100	0.877	-0.211	0.180

The awareness of the Participants regarding the Ultraviolet effect on the eye health

The adjusted odd's ratios showed low level of awareness among the males students at all academic levels regarding the relation between the Ultraviolet effects on eye health. The students with good and very good GPA believed that there is a strong relationship between the ultraviolet effects on eye health; unlike pass ones, (Table 5).

Table 5 The adjusted odds ratios (ORs) with associated 95% confidence interval (CI) with its lower and upper limits for the awareness of students with different characteristics regarding the Ultraviolet effects on the eye health, n= 173.

Parameter	Odd Ratio	Standard Error	p-value	95% Confidence Interval	
				Lower Limit	Upper Limit
Sex: Male	-51.895	48.875	0.288	-147.689	43.899
Academic Level					
1 st	-67.145	63.339	0.289	-191.287	56.996
2 nd	-90.258	85.557	0.291	-257.947	77.430
3 rd	-70.929	66.813	0.288	-201.880	60.023
4 th	-87.378	81.711	0.285	-247.529	72.772
5 th	-3.009	23.394	0.898	-48.860	42.842
6 th	-50.435	48.174	0.295	144.855	43.986
GPA					
Pass	-92.258	87.647	0.293	-264.043	79.528
Good	27.521	28.268	0.330	-27.883	82.924
Very Good	18.088	19.686	0.358	-20.496	56.673

4. DISCUSSION

The assessment of the awareness and perception of Al Baha medical student's regarding eye health is considered of great interest due to the Al Baha special geographical topography, to enhance their local community serving role. The study revealed predominance of males students at 6th year academic level have a very good Grade Point Average, the due to the acceptance policy which allow double acceptance for males, while the 6th years students as a final program level are more participating in the community service events and majority scored high grades this may be due that, the faculty of medicine attract the students of the highest academic score in the higher secondary exam, this in line with (Reem et al., 2021). Regarding the High altitude and pregnancy effects on eye health, male students showed low level of awareness at both basic and clinical phases the, this is contrary to the intermediate levels whom showed high awareness levels. In addition to, the students with pass GPA believed that there is a strong relationship between the high altitude and pregnancy effects as a risk factors for an eye health, unlike those with Good and Very good GPA whom attained a weak awareness, this against the expected outcomes.

The relation between the medication effects on eye health appeared high level of awareness among the males students at early and late levels, this may be due to the early students affected dramatically by the media, whilst the latest students undergo several orientation process during the fifth year where they taught a reasonable amount of Ocular pharmacology within the Ophthalmology module and experienced several community health events in a form of screening and awareness campaigns, this contradict with (Bo Li et al., 2016) whom identified strong desire for more ophthalmology teaching during medical school education. The contact lens effects on eye health showed high female students awareness level, this in line with (Tichenor et al., 2021) who mentioned that contact lens has disastrous complications when use without awareness or caution. Moreover, the students with very good GPA showed high awareness level regarding contact lens and Ultraviolet effects, unlike others which can be taken as an evidence for their academic superiority.

The findings revealed a low level of awareness among the males students at all academic levels regarding the relation between the Ultraviolet effects on eye health, this mean that the females unlike males has more care sensitivity regarding their things affecting the beauty such as Sun-light this reflect their response in the study, whilst the male students required UV-Safety precautions and interventions to increase their awareness levels as reported by Toro-Huamanchumo et al., (2019).

5. CONCLUSION & RECOMMENDATIONS

We conclude that, the acceptance policy at FM-BU favors the male, whilst the final year medical students were with more community health service participation and scored a very good GPA predominancy. Study participants showed different awareness levels out of our expectations regarding the effect of high altitude and pregnancy on the eye health, thus we recommend more evaluation to determine the sort of this unexpected results. The awareness level of early and late levels of Al Baha medical students is high and more chance should be given for the early student's level to participate in community services events. Females and brilliant students have high awareness level regarding the contact lens and Ultraviolet effects on the eye health. Besides, the

male students need more orientation regarding this issue. The male students required more information about the UV-Safety precautions and interventions to increase their awareness levels.

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Authors' Contributions

Ali conceived the original idea, Mahadi and Aimun, designed the study, Modi, Osama Hassan, Manal, Osama Abdullah, Majed and Linda collected the data, Aimun and Amjad analyzed the data, Mahadi drafted the manuscript, and Ali revised it. All approved the final version that was submitted. All were equally contributed. All authors approved the version to be published and agreed to be accountable for all aspects of the work.

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Conflict of interest

The authors declare that there are no conflicts of interest.

Data and materials availability

All data associated with this study are present in the paper.

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